



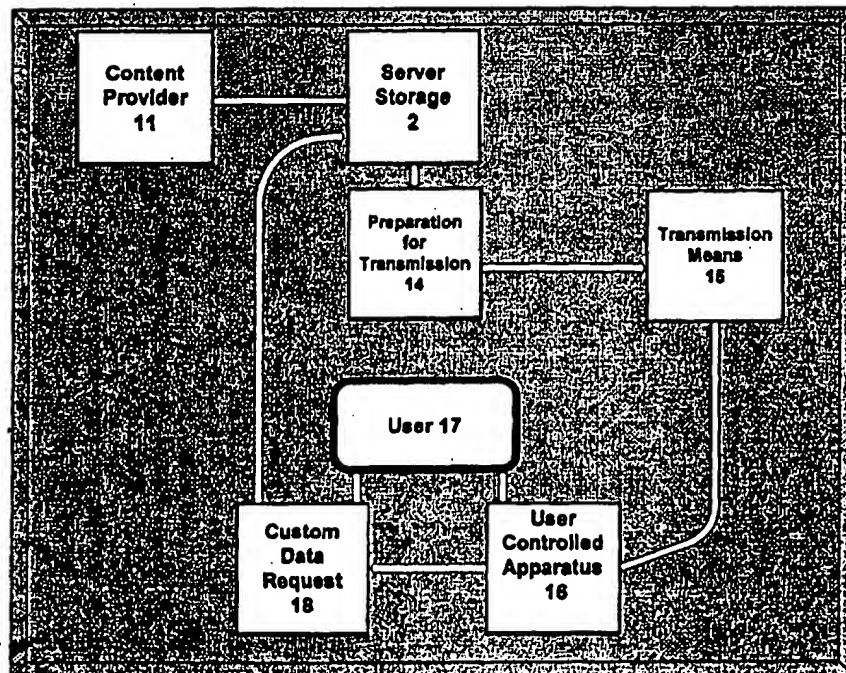
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(54) Title: INFORMATION AND ENTERTAINMENT PROGRAMMING BROADCAST SYSTEM AND DEVICE

(57) Abstract

A system for providing entertainment and/or information programming to a plurality of users in a uniquely useful form. The system comprises a point of origin content provider (11) compiling programming into encoded and segmented data files via a predetermined protocol and a computer server (2) capable of digitally recording, uploading, and holding the data files in digital form representing sensory perceptible expressions. The system further includes a means of transmitting the digital data (15) in a time-compressed and possibly encrypted manner and a user controlled apparatus appropriate to the transmission means and having means to receive and store the encoded, compressed digital data files and a means to playback the data files. As the transmissions are received, the appropriate data files are extracted, compiled into discrete data files, possibly watermarked and stored in digital form. Since the predetermined protocol is programmed into the user-controlled apparatus, the data files can be converted to sensory perceptible entertainment and/or information one file at a time.



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INFORMATION AND ENTERTAINMENT PROGRAMMING BROADCAST SYSTEM AND DEVICE

This application claims the benefit of application serial number 09/213,312, filed December 15, 1998.

5

BACKGROUND OF THE INVENTION

This invention relates generally to the field of information and/or entertainment programming and more particularly to the compilation, transmission receipt and playback of such programming as discrete data files in near real time or delayed at the choice of the user. This invention provides for processes and devices, which incorporate digitally stored information or entertainment programming on stationary or removable memory devices, such as disk drives, flash cards or semiconductor type memory, and means for converting the digital programming into output capable of perception by one of the human senses. When interfaced with an appropriate conversion means, the contents of the digital programming files are converted to a sensory perceptible expression, e.g., aural, visual, tactile, olfactory or taste. Even more particularly, the invention relates to a system which includes at least one point of origin content provider, compiling the programming into encoded and segmented data files and transmitting the data files to at least one device provided with means to receive and store the information or entertainment programming from a broadcast programming system, as compressed, encoded and possibly encrypted data files, and a means to playback the data files.

20

One version of the present invention is seen as a replacement of, or an enhancement to, standard radio by means of reconfiguring such programming into a series of discrete segments or files to be played back to the listener who can manipulate the content of the programming. Radio

has been available for many years, and provides the consumer with a selection of audio programming directed at different tastes, which is transmitted to and discerned by the listener in real time. The familiar terrestrial radio signal is locally broadcast and thus limited in range to the power of the transmitter and the quality of the antenna and receiver. Further, the listener is at the mercy of the radio programmer, in that the selection and sequencing of the broadcasted material is controlled by the content provider, i.e., the radio station. If the listener does not like the selection, the only option available to the listener is to change stations. Certain musical or informational formats may not even be available in a given locale. Because of these limitations, cassette players and compact disc ("CD") players have become very popular. The cassette or CD players give the listener control of the format - the listener can play whatever prerecorded cassette or CD he or she desires at any time. The downside to these devices is that cassettes or CDs must be purchased and have limited storage capacity, the user must transport a large number of cassettes or CDs to provide a range of choices or preselect certain CDs or cassettes when a player is utilized. The present invention further provides the means to greatly broaden a user's choice of other types of sensory perceptible entertainment or informational programming, e.g., television, movies, books-on-tape, weather reports from distant cities and stock quotations from foreign stock exchanges.

Another version of the present invention allows a user to select a service broadcasting multi-channel compressed, encoded and possibly encrypted digital data files representing audio works prioritized and segmented in novel form which allow the user several means to manipulate the reproduction and storage of files representing those works. This is opposed to proposed services whereby a user may select one of the many channels. With such services the streaming material on the selected channel will be decompressed and decrypted and presented to the

listener in audio form in near real time. However, the material may not be manipulated by the listener other than by changing channels similar to tuning a station on a conventional broadcast radio receiver. Systems have also been described that allow a user to access and have downloaded the user's selections of limited quality, audio speech works, for example, U.S. Patent
5 No. 5,841,979 to Schulhof et. al. Once received, these selections are stored on removable media for playback on a player at a later time. With this system, users must make their selections in view of the service providing the selections.

The present invention expands the user's control of their environment by storing material that is received in a manner that the user, in addition to selecting channels, can select from
10 among several files buffered within the user controlled apparatus. The user can then interact with the chosen selection in several ways. The user may store the selection for future reference. Also, the user, for example, may skip, repeat, fast forward or pause the current selection. The buffered works are constantly being replaced on a basically first in first out or prioritized basis. The user has a constantly refreshed set of selections from which to choose.

15 In the invention presented here, while it is possible to download specific selections via an optional ordering means, in general, selections are made from those broadcast in view of only the user. The broadcast service has no visibility as to what selections the user is making. This allows users to make their selections in private.

It is an object of this invention to provide a novel way for a user to retrieve, store and
20 manipulate audio or other data from a remote source in a more convenient and discriminating form. It is a further object of this invention to provide a process whereby broadcast programming is segmented, tagged and prioritized as data files, transmitted and then received such that a user controlled apparatus identifies the data files, stores and manipulates the playback

of the data files in a more convenient and discriminating form. Yet another object of this invention is to provide a user apparatus with control features allowing the reception of specially coded transmitted data, storing that data in a memory storage device (removable or non-removable) and playing back the data in a convenient and discriminating form.

5 It is an object of this invention to provide a user controlled apparatus and system capable of storing a relatively large amount of information or entertainment programming, in a digital data format with relatively instant access to any piece of stored data for playback, where the stored data may be automatically updated with new data. Still another object of this invention is to provide a user with privacy in the selection of content originating from the programming
10 source while operating a user apparatus. An additional object of the invention is to provide data in an encoded and encrypted form so those users could have access to the transmitted data at different access levels and to provide a way in which a data file can be "watermarked" so that it can be traced. Still another object of the invention is to provide a secure information broadcast network.

15 SUMMARY OF THE INVENTION

The present invention provides a system whereby one of more users have access to a wide array of entertainment or information programming. According to the present invention, the user can privately pre-select from among several choices provided by a multi-channel content provider. This invention further provides for a system that allows for the programming to be
20 transmitted as discrete data files which may be encoded and encrypted. This invention further includes means to selectively download specific programs from specific content providers. The present invention is applicable to almost every sensory perceptible form of interaction including

visual, e.g., documents and pictures (moving or still), tactile, smell or taste. However, the broadcast service of the present invention generally is described with regard to audio material.

The invention is a system for providing information or entertainment programming in digital form to a user controlled apparatus where the user chooses the particular program material from that broadcast and further decides how to manipulate it. An embodiment of the present invention provides a computer server capable of digitally recording, holding and uploading information or entertainment programming and is further able to transmit such digital data in a time-compressed, encoded and, when applicable, encrypted format. Such transmitted digital data is received and processed by the user controlled apparatus which includes a readable/writable memory storage mechanism (e.g., disk drive, hard drive, memory or flash card system) and playback or player feature interfaced with an appropriate means for receiving the data. As the transmissions are received, the programming signal is demodulated and stored in digital form as a buffer to be accessed by the playback mechanism. The data is then decompressed, utilizing, if necessary a digital-to-analog converter, one file at a time and played back to the listener. As each file is played back, the listener may choose to save the file for future replay or passively allow playback to continue without interruption. As available memory allows, additional information or entertainment programming will continue to be received and stored until the storage device is filled to capacity, even as the consumer simultaneously manipulates a previously received file.

These new files are constantly being transmitted through any of several means, including analog or digital broadcast, available on any medium, including terrestrial, satellite, PCS/cellular, cable, telephony or the internet. The user controlled apparatus is, therefore, constantly refreshed as files are played back or manipulated by the listener. As an option, the user or the user

controlled apparatus could have access to a modem, which would allow the listener to request custom files using a conventional voice/data 2-way communications gateway (e.g., telephone, cellular, pager, etc.) between the consumer and the computer server. The computer server would then send the requested file to the consumer's user controlled apparatus via a separate
5 transmission. These custom files could include, for example, movies, weather reports, sports scores, books on audio or foreign language lessons. The user controlled apparatus may provide means to display encoded alphanumeric information related to the information or entertainment programming contained within its memory (ephemeral or durable) and other information regarding the operation of the system. Such a display could also show
10 other information such as traffic and weather reports.

The present invention provides a means for the users to have much more control over their environment. It provides a means to selectively receive and store files from channels meaningful to the user and then manipulate that collection of files thus stored in memory similar to the flexibility experienced when playing a CD ROM. Individual selections can be chosen and
15 features such as fast forward, repeat, pause and skip could be employed. For example, if the user chooses to play a current traffic report, but is distracted during playback and does not comprehend the report, the user could depress "Repeat" and hear the report again.

The user controlled apparatus is a device that allows the user to experience selections of their choice from a menu list that is constantly being refreshed. At the user's option, the user can
20 either select items to be "played" or let the user controlled apparatus make the selections. The source of the broadcast material may be a public network, a private network, or a subscription

service. Of importance to the user is that there is an ever-changing menu of items from which to choose.

An important aspect of one implementation of this system is freedom and privacy. The selection process takes place in the listener's user controlled apparatus. There is no inherent way
5 for the content provider transmitting the data to know what is being selected. In another implementation, however, it may be important for the content provider to know what material the content provider's audience is choosing. In this implementation, a monitor return channel is provided for in the system design. Information regarding user choices is fed back to the content provider via a monitor return channel.

10 The user controlled apparatus must access a data stream. The data stream will consist of compressed and probably encrypted data files representing sensory perceptible works. One example of a sensory perceptible work might be an audio work such as a musical rendition. Another might be an information document. There are a number of possible multiplex methods to generate several channels of streaming information. Assume the user controlled apparatus can
15 access a multi-channel data stream and can process each selected channel from a number of channels individually. For example 100 channels are broadcast in the data stream and 15 are selected for processing. Each of the 15 is processed individually. At this point it is assumed that each file contains information that is accessible as to its encryption, subject matter, and other items of interest. As a file is being received into a buffer, the file header is opened and access
20 eligibility is determined. If an access match is determined the file is stored in the temporary or "ephemeral" memory and the information is fed to the menu buffer. This takes place for each channel. When the ephemeral memory is full, the oldest or lowest priority file in the ephemeral

memory is replaced with one or more new files. The files are stored in their compressed, encoded and, if applicable, encrypted form. The process continues indefinitely.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of the overall information and entertainment system of the present invention.

FIG. 2 is a block diagram of the user-controlled apparatus of the present invention.

FIG. 3 shows the user interface in a passive retrieval mode.

FIG. 4 shows the user interface in active retrieval mode.

FIG. 5 is a block diagram of a corporate broadcast network.

DETAILED DESCRIPTION OF THE INVENTION

The invention will now be described in detail with regard for the best mode and the preferred embodiment. In its present preferred embodiment, the invention provides for a system comprising a content provider which decides upon the informational or entertainment programming to be broadcast, a computer server and a means to transfer or transmit the programming as segmented data files in a compressed, encoded and, if applicable, encrypted manner to a user controlled apparatus capable of receiving, storing, decoding, decompressing and, if applicable, decrypting the data files and then playing them back.

The content provider groups all of its various programming elements into discrete programming segments of similar material. It is important that each segment be reasonably short in duration, so that each segment may be converted into relatively small data files, minimizing the time required to later transmit each file. As each segment is created and converted into a discrete data file, it is encoded with various information, which could include a time stamp, order

of priority, content description, etc., according to a predetermined protocol, giving each file a unique identity. The predetermined protocol provides the user controlled apparatus with means to convert the files into sensory perceptible entertainment and/or information one file at a time.

The computer server can be a computer or communicating computer network associated
5 with production facilities similar to standard production studios for radio broadcasting. The production facilities may have music or voice recording libraries of prerecorded music or voice offerings on standard recording media (tapes, CDs, etc.), and means to record and store live music or voice recordings. The recorded musical works could be categorized as to format, such as classical, jazz, contemporary, rap, etc., and the recorded spoken works could also be
10 categorized as to format, such as commentators, instructional, books-on-audio, etc. The computer server translates and stores the audio works in digital form, in a compressed, encoded and, if applicable, encrypted manner. The computer server is further capable of communication with transmission means to deliver the data stored in the computer to the transmission receiving means of a user controlled apparatus.

15 There are a number of transmission media which a service may broadcast multi-channel files to be used as input to the user controlled apparatus. The only requirement is that the medium has the bandwidth to carry the information in a digitally compressed form and that the user controlled apparatus be capable of receiving, decoding, decompressing and, if applicable, decrypting the information. Such a multi-channel broadcast means allows for the simultaneous
20 playback of a file while downloading the same file or playing back another file previously loaded in the memory component of the user controlled apparatus. The information may range from limited quality audio speech files to high quality stereo music. With regard to a preferred

embodiment a transmission means to deliver the data in time-compressed, encoded and, if applicable, encrypted manner from the computer server to portable or fixed user controlled apparatus is provided. Preferably this transmission means comprises a transmitter capable of sending modulated data via an extremely high data transfer rate system, and may comprise
5 satellite, radio, microwave, PCS/cellular, other known wireless transmissions using terrestrial or satellite means, twisted pair, T-1, ISDN, xDSL, cable or other known wired or optical fiber means. It is contemplated that such transfer of data from the computer server to the user controlled apparatus would incorporate compression and various multiplexing technologies to achieve high-speed transmission rates.

10 There are a number of systems disclosed that provide for transmitting simultaneously a number of channels of compressed data files representing sensory perceptible works to a plurality of receivers. With such receivers, the user may select a given channel and experience the sensory perceptible work streaming on that channel. This is similar to a conventional radio broadcast receiver where the user can select a broadcast frequency and listen to the content being broadcast
15 at that moment. The user's only real control is to select the station and vary the qualities of the reproduction, e.g., loudness, speaker direction and frequency response equalization, of the received work.

The broadcast system of the present invention is set out in Fig. 1. The programming is encoded, i.e., prioritized and cataloged, by the content provider 11 and then put in a pre-
20 determined segmented form and stored on a computer server 12. The server stores the encoded and segmented program material for later transmission by the content provider. The programming is then prepared for transmission: the content provider compresses, sequences and channelizes the programming, and the program material is multiplexed and, if applicable,

encrypted 13. The programming is then transmitted by an appropriate transmission means 15, such as satellite radio, terrestrial broadcast, internet, cable TV PCS/cellular or telephony. The transmitted programming is received by a user controlled apparatus 16, which is adapted to receive the programmed material in the particular segmented form, as broadcast by the content
5 provider. The user 17 can passively enjoy the broadcast or, by manipulating the user controlled apparatus, may change the playback sequence of the programming. Additionally, the user can request custom programming 18, by ordering it from the content provider via an external means, such as a computer modem or by telephone, or by entering pre-assigned customization codes into the user controlled apparatus. Upon receipt of a custom data request from the user, the content
10 provider will encode the program material in segmented form and the process, as set out above, continues.

The preferred embodiment of the present invention allows for either of two different modes of multiplexing technology to be utilized -- file sequential multiplexing, where compressed files that are transmitted at data rates faster than the user's ability to open and "read"
15 them, and segment sequential multiplexing, where data is transmitted in near real time, but compressed to allow other discrete data to stream simultaneously, while sharing a prescribed bandwidth or spectrum allocation, allowing for a number of channels to send segments of files. A music formatted radio content provider will be used to illustrate embodiments utilizing the different technologies.

20 When file sequential multiplexing is used, a musical content provider programs to its listeners by transmitting a sequential series of compressed audio files, each containing one or more songs forming its playlist. Other programming elements, e.g., commercials, newsbreaks, stop sets, etc., also could be transmitted as separate, compressed audio files.. The rate for the

transmission of these files is significantly faster than their rate of playback. The content provider transmits the files to the user controlled apparatus so that the files may be stored for replay at the listener's convenience. In effect, the user controlled apparatus remains in a "stand by" mode actively receiving and, if necessary, refreshing the ephemeral memory when the user is not
5 listening to the radio. In order for the content provider's transmitted data to remain timely, e.g., news, weather, commercial, traffic reports, etc., the files may be tagged with encoded information that directs the ephemeral memory of the controlled apparatus to refresh certain types of files with more current or relevant material. Even if the user controlled apparatus is in concurrent use by the listener, some files may be given priority over others by the content
10 provider due to the nature of the information. For example, music files might be given a lower priority than weather bulletins or traffic updates, which would cause the user controlled apparatus to automatically rearrange the sequence of the files in its ephemeral memory even though a file with a lower priority was received earlier. The following is a typical sequence that could occur assuming the listener is in the midst of listening to song #1:

15	<u>Download Sequence</u>	<u>Reprioritized Sequence</u>
	1. Song # 1 (priority level 4)	1. Song #1 (priority level 4)
	2. Song #2 (priority level 4)	2. Weather bulletin (priority 1)
	3. Song #3 (priority level 4)	3. Traffic report (priority 2)
	4. Commercial break (priority level 3)	4. Commercial break (priority 3)
20	5. Weather bulletin (priority level 1)	5. Song #2 (priority level 4)
	6. Song #4 (priority level 4)	6. Song #3 (priority level 4)
	7. Traffic report (priority level 2)	7. Song #4 (priority level 4)

This ability to time-shift and store data files may be very useful to the commercial content provider as well as an advertiser and the listener. In today's commercial radio market, listeners are sometimes subjected to seven or eight minutes of continuous advertising before the station returns to the programming first sought by the listener. Although programming long commercial breaks allows the broadcaster to provide more songs without interruption after the break, many of the listeners in search of more immediate entertainment or informational content are lost to other stations. According to the present invention, extended commercial breaks can be substantially reduced. For example, a radio station programming 16 minutes of commercials per hour, might reduce the commercial time four minutes, while still accommodating the same number of advertisers. Instead of 16 one-minute commercials, the station runs 16, 15-second commercials (only four, one-minute breaks). Each message would be a commercial ID or teaser spot, encouraging the listener to hear more about their product or services by pressing a corresponding function button on the user controlled device. If the listener does nothing, the following messages continue to play until the commercial break ends and entertainment or informational programming begins. If the listener selects an available option within a pre-determined listener response period, the user-controlled apparatus will begin playing a longer message from the advertiser. If so desired, the content provider could provide links to even longer duration commercial messages, which could be accessed by the listener in a similar manner. This feature is made possible by the content provider transmitting a cluster of commercial messages in file form in series, each linked to additional corresponding messages.

A typical sixty second commercial break might reflect the following sequence:

Commercial Break (:60)

1. Commercial A (:15)

2. Commercial B (:10)
3. Commercial C (:15)
4. Commercial D (:20)

In the above example, a listener intrigued by mention of a sale offered during
5 Commercial C could use a predetermined function key within the time allotted to respond, in
order to hear a longer message about the sale. By selecting a predetermined function key again,
the listener could hear even more information about the sale.

Example:

1. Commercial C (:15)
- 10 2. Commercial C (standard) (:60)
3. Commercial C (extended) (:120)

Similar messages or tiered spots could be stored in the user controlled apparatus for the
other three teaser 15-second "first tier" commercials in the aforementioned break. However, in
this example, since the listener did not choose to find out more about the other commercials,
15 they, along with their accompanying tiers, will be discarded by the user controlled apparatus and
replaced by the next series of spots in the next commercial break. This commercial tiering
approach could take on numerous forms, depending upon the sales structure of the commercial
content provider and compression, transmission and data rate of the system used. As the tiered
file sizes grow larger and increase in number, the time taken to transmit the material begins to
20 exceed the time taken to listen to it in real time. The guiding principle of the process however, is
to package and transmit a depth and variety of commercial material, while requiring a minimal
amount of time invested on behalf of the listener, unless the listener so chooses hear more
commercial content. Although the listener may not be able to "skip" forward during the break to

music programming, the listener welcomes this tradeoff since there will be no seven or eight minute break as broadcasted by the competing radio stations.

With this system, the advertiser enjoys the broadcasting equivalent of direct mail, advertising in a less cluttered environment, being more likely to reach the desired audience, since the audience is less likely to tune out as they might during an extended commercial break. The broadcaster benefits because there is more commercial time to sell. Also, audience retention and ratings remain higher since listeners, knowing that the commercial breaks are relatively short and having the flexibility of skipping any song they do not like, stay tuned to the station. Listeners also benefit from the flexibility and choices afforded by the system. According to the present invention, listeners have more control of the programming available to them (entertainment, information and commercials) and less exposure to undesirable programming.

The above scenario could be described as basically "passive retrieval," because if the listener does nothing but listen, programming will automatically play one file at a time in a sequence predetermined by the content provider. Only when the listener chooses to manipulate the data files, is the sequence modified (e.g., skip/next, pause, save, replay, etc.). At this point, passive retrieval is modified by a reactive response. In other words, the listener only responds after hearing the programming that is automatically being played and has been maintained in the ephemeral storage of the user controlled apparatus as discrete data files.

When the file segment multiplexing is used, the content provider programs to the listener in the same fashion as with file sequential multiplexing. However, in contrast, the data rate for the transmission of the file segments would be approximately equal to the user's ability to "open" and listen to the data files. When using segment sequential multiplexing, the content provider can simultaneously transmit more than one signal within an assigned bandwidth, thereby offering

the listener several programming choices within spectrum space that might normally allow only one. As with file sequential multiplexing, the user controlled apparatus remains in the "stand by" mode, receiving portions of the several simultaneous transmissions (sub-channels) from the content provider and storing them for future access by the listener. The ephemeral memory
5 would hold in queue a limited number of selections so that the user could "skip" past an undesirable selection to the next one on that sub-channel or "scan" over to the next sub-channel to review those selections. Just as with file sequential multiplexing, the files are compressed, prioritized, stored, refreshed and accessed in the "passive retrieval" method as previously described.

10 Custom files could also be accessed in much the same fashion as described earlier, but with an "active retrieval" response. If access to the custom files is at the point of origin, i.e., the user must contact the content provider via modem, POTS or other known two-way communication to request a specific file, the content provider could process the order (i.e., invoice, order the file and transmit it along with its regular programming). There are a variety of
15 ways the provider could charge for this service (e.g., per request, by the minute, bulk rates – up to "x" requests for "y" dollars, etc.). While the listener's privacy is lost by contacting the content provider, the latter can compile valuable profile information about the user's listening habits.

Using another embodiment of the present invention, where the listener orders custom files via the user controlled apparatus, the transaction can be private, i.e., the content provider
20 will not know which custom files are being received by a particular listener. This is possible where the content provider transmits these custom files on a periodic basis. However, unless the user enters a specific code into the user-controlled apparatus, the user controlled apparatus will ignore the custom files. When a custom file preselected by the user is transmitted, the user-

controlled apparatus recognizes the coded custom file, retrieves and stores the file in durable memory to await manipulation by the user. The custom file will not be overwritten until the material either "times out," the listener listens to it or the listener discards it. The custom programming could be offered as a free service to the content provider's listeners or sold as a subscription-based feature, offering unlimited access to the custom files for a monthly fee. The user-controlled apparatus could be addressable, allowing the content provider to control access to the service, based on current subscriptions.

The durable memory is the portion of the user-controlled apparatus that holds custom files specifically requested by the listener. Regardless of whether the files are accessed at the user controlled apparatus end of the transmission or the content provider point of origin, the files must be tagged and stored with a discrete identifier. It will be either transmitted in series with other common files on demand or randomly, depending upon the process best suiting the content provider and means of transmission. In either case, the listener has a list of custom files, i.e., programming that have a special interest to portions of a mass audience (e.g., books on audio, language lessons, dining out suggestions, etc.).

In either file sequential multiplexing or file segment multiplexing, an added benefit to the content provider will be insurance against a fading or interrupted signal, since the user controlled apparatus is in fact always storing transmitted data prior to the user actually accessing it. The listener only experiences an interruption in service, if the interruption in the transmission is extensive. In the case of file segment sequential multiplexing, if the listener continued to skip forward within the ephemeral memory until all but the last preloaded file had been discarded, the listener would then be listening to the last preloaded file. It is possible that the listener could skip forward with the ephemeral memory until all but the last preloaded file had been discarded,

thereby exhausting the buffered files. In such a case, the user controlled apparatus would not allow the user to skip further forward unless and until the ephemeral memory had been refreshed. When utilizing file sequential multiplexing, the listener would have less time to wait for the next download since the files were being transmitted at a faster rate.

5 The user controlled apparatus may be a completely portable d/c powered device which can be carried by the user, with the audio output delivered through small speakers or headphones. Alternatively, the user controlled apparatus may be designed to be a stand-alone unit for use in the home or office and powered conventionally by electricity, or a unit installed in an automobile in a manner similar to standard cassette or CD players. The data storage component of the user
10 controlled apparatus could be removable for transport or even interchangeable with other user controlled apparatuses. The user controlled apparatus could also be a peripheral device used to enhance the functions and features of a conventional AM/FM/satellite receiver, PCS/cellular device or computer. The user controlled apparatus is a microprocessing unit and has means for receiving the transmission and means for data storage. If audio programming is being received,
15 then the data storage means preferably consists of a disk drive, hard drive, semiconductor memory or flash card system capable of storing a large amount of audio programming in digital format and in individual files. If operated via computer, a portion of the computer memory could be used so as to eliminate the need of a separate storage component. Additionally, the data storage means further includes a read/write mechanism able to replace or overwrite an old file
20 with one or more new ones, until the data storage device is fully loaded. The user controlled apparatus further comprises means to decode and convert the digitized data to an analog signal audio output. The user of the present invention can then select from the menu the file the user

desires to "play". Play is used here to convey a number of sensory perceptible possibilities such as hear, smell, feel, see ... etc.

The user controlled apparatus of the present invention may be viewed as a process. The user controlled apparatus must have access to a service transmitting data files in a known form via a transmission medium. It must then process, and optionally watermark, files from the data stream based on some criteria such as access codes in the file header. The user controlled apparatus must buffer the processed files and select particular files from the buffer or storage device. Moreover, the user controlled apparatus must be able to overwrite older files in the buffer, decode, decompress and, if applicable, decrypt files. The user controlled apparatus process may be implemented in hardware, in software or a combination of the two. Implementations might include a standalone receiver box, an integrated unit or a peripheral device, but, as previously described, could include a personal computer employing the computer's resources driven by process software.

The user controlled apparatus, which approximates a radio receiver, is shown in FIG. 2. Data from a data stream source is fed into the stream director 22. The stream director under the control of the system controller 24, and comprised of a demultiplexer and a channel selector demultiplexes the data stream, reads the embedded channel code and, if applicable, encryption and encoding keys and directs data to the appropriate channel buffer 26. The channel buffer compiles the discrete files. The system controller then interacts with the data file in the channel buffer to determine a number of possible parameters. If the file meets preset criteria, it may be watermarked, and then is passed to the ephemeral memory 30 or the durable memory 32 by the system controller. Once in the ephemeral memory, the file may be manipulated by the user through the user interface 28. Once the user, through the user interface, decides to play a

particular data stream from either the ephemeral memory 30 or durable memory 32, the system controller 24 sends the data through an optional decryption module 34 and decompression module 35. The audio signal then passes through a playback module 36 to a system output device 37, e.g., drivers and/or amplifiers and finally to a user accuator 38, e.g., speakers or
5 headphones.

Ephemeral memory is short lived or transitory as compared to more durable memory. Files are loaded into ephemeral memory with a time or priority tag. When the ephemeral memory is full, the files with the oldest time tags or lowest priority will be replaced with incoming files. Thus, the older or lower priority files are constantly being replaced. Durable
10 memory is longer term memory as compared to ephemeral memory. In addition, some action on the part of the user is required to place a file into or remove a file from durable memory. In a given memory system the line between ephemeral and durable memory is arbitrary. In fact, they can be of different technologies. The boundary between the two may move according to the needs and desires of the user. For example, file memory might be a section of RAM or a hard
15 disk. Whether a file is defined as in ephemeral memory or durable memory is determined by the system controller. The system controller also determines the boundary between the two, that is, how much memory is allotted to each.

Files in ephemeral memory are replaced in a timely manner determined by a software algorithm. One option the user has is to designate a file to be placed in durable memory for
20 longer-term retention and access. Depending upon the system architecture the file might actually be moved from one memory location to another or the pointer to its location and status in a vector and status table under software control might be changed. In that case, the file stays where it is and the pointer to it changes from ephemeral to durable. The use of microcontrollers

and software, which have enormous capability to easily bookmark and manipulate information, allow the files to become available in both ephemeral and durable memory. Microcontrollers and software have an enormous capability to bookkeep and manipulate much related information easily. The result is that a number of files eventually become available in both ephemeral and
5 durable memory.

There are many ways these files may be accessed and manipulated. In the simplest form, the oldest or highest priority file in ephemeral memory is played and then discarded when the next file or files are received. The user does nothing but turn the receiver on. In this form, programming proceeds to playback without the need of any further action on the part of the user.
10 Interaction with the process, e.g., skipping, pausing or repeating a selection or tagging a selection for durable memory, is possible at the discretion of the listener. Also, selections can be made from durable memory.

Further, it is possible to "bank" a set of selections of the user's choice to be played without user intervention. The user uses the display panel and selection keys of the user
15 interface to make selections from ephemeral and durable memory. The selections thus "banked" are played in the order selected without further user intervention.

When a file has been selected for play either by algorithm or user selection, it is fed to the decryption function and then to the decompression function before being fed to the playback function. It is not necessary in all cases that files be encrypted or compressed. Encryption
20 provides security for the owner of the material and the propriety of the content provider as to the material broadcasted. Compression makes the transmission process more efficient and allows the broadcast of more information in the same time and space. Generally, however, the file might not necessarily exist as a playable file as such in the user controlled apparatus. The file

would generally, but not necessarily, be stored in memory in its compressed and, if applicable, encrypted form. The playback process would perform the decompression and, if applicable, decryption functions. The file in compressed form requires less storage space. And, if applicable, storage in encrypted form provides greater security for the file content.

5 There are several possible embodiments of the user controlled apparatus, as described by FIG. 2. For example, according to this invention, the user controlled apparatus could be a Satellite Digital Audio Radio Receiver ("SDARR"). Such a user controlled apparatus would be used in conjunction with a digital audio multichannel satellite service whereby multiple channels of music and information type programming are broadcast simultaneously through segment
10 sequential multiplexing. Such a SDARR would include an antenna to receive the signals from the satellite and send them to an RF receiver and a demodulator. From the demodulator, the signals would be fed to a stream director. The stream director, under control of the system controller, would select channels from the incoming multiplexed data stream and feed the selected channels to the channel buffers. Since fragments of each file may be transmitted
15 multiplexed across the multiple channels, each file must be recombined in the buffer to form the complete file. From this point, operation of a SDARR would be as explained in FIG. 2.

 There are a number of alternative forms a SDARR could take, including as an in-dash integrated receiver, an audio cassette substitute, a CD player CD substitute, a home unit or a portable radio. Moreover, instead of being integrated into the SDARR, the user controlled
20 apparatus could take the form of a peripheral or "standalone" device. In each case, the SDARR would functionally be the same and only the method of coupling to the audio system would vary.

 Similarly, the present invention could take the form of a Digital Subscriber Line ("DSL") user controlled apparatus. DSL service is becoming available to quickly transfer large amounts

of digital data over copper twisted pair lines, such as ordinary telephone lines. There are a number of standards either developed or being developed for DSL such as ADSL, HDSL, RADSL, VDSL and others. Therefore, a proposed xDSL user controlled apparatus exemplifies the aggregate of these standards. With xDSL service, there is the potential for communications to be two way. In other words, with a xDSL user controlled apparatus, a user could interact with the broadcast service.

With an xDSL user controlled apparatus, connection is made to the broadcast service and digital data files stream into the stream director. The data stream structure must be known to the user controlled apparatus and there are a multitude of possibilities for the data stream structure. From this point, the xDSL user controlled apparatus performs similar to a SDARR, unless two way communication is utilized. With communication upstream, it is possible for the service to monitor embedded data streams. Similarly, particular programs of a "free" service or requests to a subscription service could be made this way.

An internet user controlled apparatus could operate in a manner very similar to the xDSL user controlled apparatus discussed above. Connection is made to the internet and the data stream flows into the user controlled apparatus. Such an internet user controlled apparatus could approximate an xDSL user controlled apparatus in that two way communications with the broadcast service are possible. Of course, the user controlled apparatus of the present invention could include devices to receive the above transmission of data files representing sensory perceptible programming and broadcast programming from cable TV, either as a subscribed to service or from a commercially sponsored free source.

While the above examples are shown for audio, the same technique or process applies to other digital data files representing sensory perceptible programming. Of particular interest and applicability are digital data files representing TV or video.

An important component of the user controlled apparatus is the user interface or face plate. An example user interface 28 is shown in FIG. 2 helps meet one of the objects of the invention, i.e., it provides a novel way for a user to store and manipulate audio or other data from a remote source in a convenient and discriminating form. Once the data is retrieved, it can be stored in either of two modes: a passive retrieval mode (depicted in FIG. 3) or an active retrieval mode (depicted in FIG. 4). While generally the user controlled apparatus will have only one interface, the discrete applications of each retrieval mode are better understood in this illustration through the use of two separate figures.

There are some functions and features of the user interface that serve similar purposes whether in active retrieval mode or passive retrieval mode. For example, the display of the user interface, 41 and 51, represents a sensory perceptible (e.g. visual or aural) means of communicating information to the user as to the content of the data being played back or previewed. The display also confirms or signifies that a function, action or mode either selected or considered by the user. The other features which are common to both modes of operation are command keys which can be operated by touch or audible queue, for example, the pause key 42 and 52, the repeat key 43 and 53 and the save key 44 and 54 are various means of manipulating the playback of data, regardless of the Retrieval Mode employed. For maximum flexibility, the command keys may be soft keys.

To minimize the need for user input and thereby maximizing the ease of operation, the user controlled apparatus requires that there be a predetermined protocol for retrieval and

manipulation of data when used in the passive retrieval mode. Assuming that the number of passive data streams is numerous, the user must first determine which will be the primary channels of choice. The user interface will allow for each channel to be assigned a "button" 45 through the operation of a pre-set function key 46.

5 Once the user controlled apparatus is installed or activated, it is recommended that the device remain in "standby" mode to maximize its retrieval feature. This "always on" feature could be an option for the user or a default option built into the user controlled apparatus. This allows the user controlled apparatus to accumulate data files in its ephemeral memory 30 in advance, even when the user is not utilizing the device. Once the user controlled apparatus is on,
10 the user need only depress one of the primary channel buttons 45 to open or playback the first corresponding file stored in the ephemeral memory component of the user controlled apparatus. At this point, if the user elects to do nothing more, the user controlled apparatus will continue to playback one data file after the next as sequenced and prioritized by the data stream source, and free the memory space occupied by the previously played file to create more memory for the next
15 retrievable file. This seamless playback feature would continue indefinitely, until the user selected another function.

 When a channel is selected, the system controller passes the first file designated to that channel to the decryption module, if the data is encrypted, which then passes it to the decompression module and from there to the play module. While the file is playing, the user can
20 choose from a multitude of options that will allow manipulation on the previously stored data. The user can store the file, return to the file selection menu, skip to the previous file, pause, skip to the next file, restart, erase, i.e., delete the present file or the stored file with the oldest data

stamp, refresh, i.e., download fresh files, or do nothing, which will open and play the next file in the queue.

The function of the command keys could be commonly accepted control functions well known in the art, such as "Skip/Next" 47 and 63, "Pause" 42 and 52, "Repeat" 43 and 53 and "Save" 44 and 54. Each of the previous commands gives the user the power to navigate through the selected primary channel allowing the listener to focus more attention on those data files of interest while passing over those of none. Most of these function keys require little or no memory requirements, with the exception of the "Save" key. When this key is selected, the current file is saved in durable memory until such time as the user wishes to access it again. It is assumed that these saved files will not be held indefinitely within the memory storage device, but eventually "timed-out" either by design or by the user's choosing. If saved, the file can be reopened and played back by going into the "Menu" 61 operation of the active retrieval mode (FIG. 4). It is important to note that the file may be watermarked and then stored in its compressed and, if necessary, encrypted form. The file is decrypted, if necessary, and decompressed in the process of playing. In other words, the file need not exist as a playable file while buffered within the user controlled apparatus or storage aspects of the device.

In the passive retrieval mode, the user is responsive or "reactive" to the playback data, while in the active retrieval mode of the user controlled apparatus; the user is more "proactive" because he or she actually requests specific data files. As described hereinafter, the user may request that specific data be retrieved either through the use of an outside two-way communication service or at the point of reception in the user controlled apparatus. Either way, the requested file corresponds to a unique ID code, using a series of pre-assigned alpha and/or numeric characters. If the user submits a request at the point of reception in the user controlled

apparatus, he or she must first "Select" 55 the corresponding code using an alphanumeric keypad 56, then "Order" it 57. If the user makes an error in code input, he or she may "Clear" 58 the error and resubmit the request.

There are at least two ways a user can order specific files. Where the file resides with the
5 content provider, the user must request the content provider to include the specific file in the transmitted data stream. The request could be made with a special encoded key on the user interface which allows the user controlled apparatus to select the file from the data stream and store the requested file. Alternatively, where the content provider has published a catalog of selections it will be broadcasting, together with a user-accessible code, the user merely enters the
10 code via the selection keys and over time the selections are received and saved. In this case, the keyed files are being constantly broadcast and the user, through the user interface, selects and stores the desired selections.

Since the sought after data is being fed along with other active (and possibly passive) data files, the user may have a delay that could range from a few seconds to several hours, depending
15 upon the method of content delivery. However, once the requested data is retrieved by the user controlled apparatus, a "File Ready" indicator 60 could alert the user that the data has been successfully retrieved and is ready for playback. The file is identified by a description that will appear on the display when accessed by the user. This description will be accessed through the "Menu" function 61 which allows the user to scroll through all stored data by operating the
20 "Previous" 62 or "Next" 63 keys. Once the file of choice is located, the user selects "Play" 64 and the file begins playback.

During playback, the user may manipulate the file with a variety of function keys, such as "Pause" 52, "Repeat" 53, "Bookmark/Dog-ear" 65, "Save" 54 and/or "Delete" 66. "Repeat" 53

could either cause the file to immediately begin playback from the beginning or go back to the last point "Bookmarked" 65. If the user chooses to return to the file at a later time, he or she may elect to "Save" 54 and send it back into durable memory to be accessed later through the "Menu" function 61. The file could also be "Bookmarked" 65 and "Saved" 54 so that when the user
5 retrieves the file at a later time, it will begin playback at the point in which it was bookmarked. Any file in the active retrieval mode could be "Deleted" 66 at anytime by the user or the file could be pre-programmed either by the data stream source or the user controlled apparatus to "self-destruct," overwrite or be discarded when it "times-out." If the user controlled apparatus has both the passive retrieval mode and active retrieval mode features, the user can easily shuttle
10 back and forth between the two modes at will.

Although the user interfaces of FIG. 3 and FIG. 4 presume a visible menu display, an alternative or supplemental audio menu may be attractive in certain systems implementations, such as operation in a moving vehicle. In such a case the menu is either generated from a text to speech converter or a menu speech file is included in the programming phase. The user interface
15 may also allow for speech input instead of the manual manipulation of keys to control certain functions such as selection.

There are several aspects of the storage and playback of the compacted sensory perceptible files. First, while it is important to be able to store them in compressed form, it is very useful to have information about the file easily accessible. In the present invention the
20 compacted files are continuously being downloaded to the user controlled apparatus and stored. The user controlled apparatus should know something about the files before decompressing them, so it can supply a discernable menu to the user.

One solution is for each compacted file to contain an easily accessed file header that would contain descriptive information that could be presented in a discernable menu form. The file header, which may or may not be part of the file itself, could contain such information in text form, or, alternatively, it is possible to include within the header short compressed audio descriptions. The file header might contain information such as the length of the file, the name of the material, the type of encoding, the type of compression, the security keys, a description of the material and/or the playing time and type of file. Menu buffers are sections of memory assigned to hold descriptions of files for display on a menu under control of the system controller. As files are added to ephemeral memory, or moved to durable memory, entries are made into the appropriate menu buffers.

Second, it is important in some implementations that files may be individually selected by the user in private. According to the present invention, multiple methods of private selection are available. The basic method of private selection is that the user can make selections from the data file stream totally transparent to the content provider. Another method is for the content provider to broadcast or publish selections it is going to transmit with codes for each selection. The user then makes selections and enters codes for them into the user controlled apparatus, which accesses those selections by code number from the transmitted data file stream over time and stores them.

Similarly, the present invention allows the user to input entirely new recorded data into the user controlled apparatus on a continual basis. The user contacts the computer server in the required communicating manner and enters personal identification data, such as a personal identification number (PIN), social security number, password or the like, into the computer server. This information is modulated on a carrier signal and transmitted to a computer server

through a conventional voice and/or data two-way communications gateway for verification. If the account is current, access to the stored data in the computer server is allowed. The user then selects the desired audio works to be transferred and the digital data is downloaded from the computer server into the data storage component of the user controlled apparatus. The user is
5 then able to access entirely different sensory perceptible selections from those previously downloaded to the user controlled apparatus. An optional information input means is provided for the user to enter required instructions and identification data for communication with the computer server via a communication device such as modem and may be controlled using keypad, keyboard or voice activation devices in known manner.

10 Some transmissions will require encryption. Encryption allows control of usage so that a content provider can charge for its programming and provide the customer with a key to use the received data or programming. The data or programming consists of gathering, selecting and forming into several simultaneous channels of material. The programming may include the compression of the material files and/or encryption which could be access level sensitive. In
15 addition, encryption allows a higher level of security for proprietary material.

It is possible to encrypt at several levels such that all access levels could have access to the appropriate material. For example, a company desires to disseminate information to five access levels. Assume the higher the number the higher the access level. Level 1 might be to all employees and employ a 10 character key. Level 2 might be the next with a 13 character key.
20 And so on to level 5 with a 21 character key. Each access level would have access to all lower access level material.

The present invention is adaptable to provide security and flexibility to a potential corporate broadcast network in which a corporation distributes corporate information to a large

group of employees, associates, contractors, suppliers, and distributors in a secure fashion. In such a network, who gets what information is predetermined in the programming phase. The total information could be transmitted to a subscriber, however, only those with the appropriate access codes would even know of the presence of the material. The user controlled apparatus and its ability to handle encrypted files is paramount to this system. The user controlled apparatus allows a means to select and "play" items presented under control of the user. The items can include various forms of media such as sound works, documents, pictures, and video.

Figure 5 is a block diagram of such a system. Within a large organization, there are a plurality of "newsrooms," 71, 71' and 71" which select information that is to be broadcast to a select group of users within the closed private network. The newsrooms then send the information to buffers 72, 72', 72" where the data is compressed and encrypted. The data from the buffers is then multiplexed for broadcast at the multiplexer 73 and then digitally transmitted by a broadcast medium 74 to a plurality of user controlled apparatuses 75, 75' and 75".

Each user controlled apparatus receives the broadcast multiplexed data stream and each has an embedded decryption key. Each file in the data stream is tested for an access match by the decryption key. For those with an access match the compressed encrypted files are stored in the user controlled apparatus buffer. The files in the buffer are then placed in a menu for selection by the respective users 76, 76' and 76". Access to the menu or the files may be password protected. This would lower the security risk if the user controlled apparatus were stolen. In addition, each file loaded into the user controlled apparatus would be watermarked. Each user controlled apparatus would then have a decryption key, password and watermark code. In addition anyone opening a file would result in placing an identifiable watermark in that file.

It seems important that proprietary material be inherently protected by the system. Suppose that the material broadcast is encrypted. The receiving system must have the key to open it and store it etc. Further the material in the system is stored in encrypted form. Then, in the playback process, the material is decrypted, decompressed and output in the correct sensory perceptible form. Of course someone could record the sensory perceptible form of the material but not the digital file. Even if someone made a copy of the digital file, use could not be made of it without the decryption key.

It is contemplated that equivalents and substitutions for certain components may be obvious to those skilled in the art, however the described combination of components and elements which comprise the system are believed to be novel and non-obvious, and as such the true scope and definition of the invention is to be as set forth in the following claims.

We claim:

1. An information and entertainment broadcast system for the receipt of sensory perceptible expression for the compilation, transmission, receipt and playback of sensory perceptible expression comprising:

- a content provider having means to segment programming material representing sensory perceptible expression into files, means to encode each of said files with information about the file and means to communicate with a computer server;
- a computer server which stores the encoded and segmented files and has means to communicate with a transmission means;
- a transmission means to transmit the encoded and segmented programming from said computer server to a user controlled apparatus; and
- a user controlled apparatus capable of receiving said files and having a data storage means for storing said files in a digital format, a means to decode the files and a means of converting said files to real time, sensory perceptible expression.

2. The broadcast system of claim 1, where said computer server comprises means to compress, sequence, and channelize said files.

3. The broadcast system of claim 2, where said computer server further comprises means to multiplex said files.

4. The broadcast system of claim 3, where said means to multiplex further consists of means for file sequential multiplexing.

5. The broadcast system of claim 3, where said means to multiplex further consists of means for file segment multiplexing.

6. The broadcast system of claim 1, where said computer server has means to encrypt said files and the transmission means further comprises means to transmit encrypted files.

7. The broadcast system of claim 6, where said user controlled apparatus further comprises a means to decrypt said programming.

8. The broadcast system of claim 1, where said user controlled apparatus further comprises means to watermark said programming.

9. The broadcast system of claim 1, where said user controlled apparatus comprises a wired transmission means.

10. The broadcast system of claim 9, where said wired transmission means comprises one of the group consisting of cable, POTS, xDSL, fiber, ISDN, Ethernet, broadband and telephony.

11. The broadcast system of claim 1, where said transmission means comprises a wireless transmission means.

12. The broadcast system of claim 11, where said wireless transmission means comprises one of a group consisting of satellite, terrestrial broadcast, PCS/cellular and telephony.

13. The broadcast system of claim 1, where said transmission means comprises a combination of wired and wireless transmission means.

14. The broadcast system of claim 1, where said transmission means comprises of a modem interface.

15. The broadcast system of claim 1, where the data storage means of said user controlled apparatus comprises an ephemeral memory component and a durable memory component.

16. The broadcast system of claim 15, where said ephemeral memory component comprises one of the group consisting of a disk drive, a hard drive, a flash card and semiconductor memory.

17. The broadcast system of claim 16, where said durable memory component comprises one of the group consisting of a disk drive, a hard drive, a flash card and semiconductor memory

18. The broadcast system of claim 15, where said ephemeral memory component and durable memory component allow files to be moved from one memory location to another.

19. The broadcast system of claim 15, where the data storage means of said user controlled apparatus comprises a microprocessor memory component.

20. The broadcast system of claim 15, where said data storage means further comprises means to allow a file to be saved for future replay.

21. The broadcast system of claim 15, where said data storage means continues to receive and store additional files, regardless of the capacity of the data storage means, even as a previously received file is simultaneously manipulated.

22. The broadcast system of claim 15, where said data storage means is always ready for collecting data for future playback.

23. The broadcast system of claim 15, where said data storage means allows the user to selectively receive and store files and then manipulate that collection of files.

24. The broadcast system of claim 15, where said data storage means allows the selection process of files to take place without the knowledge of the content provider.

25. The broadcast system of claim 1, where said user controlled apparatus is mounted in a stationary receiver.

26. The broadcast system of claim 1, where said user controller apparatus is a peripheral device to a receiver or PC.

27. The broadcast system of claim 1, where said user controlled apparatus is integrated with a conventional receiver from a group consisting of AM/FM/Satellite Radio, TV and a PCS/cellular device.

28. The broadcast system of claim 1, where said user controlled apparatus is installed as software within the memory storage device of a PC.

29. The broadcast system of claim 1, where said user controlled apparatus can access specific data files by entering a code, said specific data files will be with the other files received from the content provider.

30. The broadcast system of claim 1, where said means to segment of said content provider further provides for tiered programming material.

31. The broadcast system of claim 30, where means of converting of said user controlled apparatus further provides for the sensory perceptible expression of tiered programming material.

32. The broadcast system of claim 1, where said user controlled apparatus has means to allow specific sensory perceptible programming to be requested from the content provider.

33. The broadcast system of claim 32, where said content provider has means to prepare segment and encode the specific sensory perceptible programming requested by the user controlled apparatus.

34. The broadcast system of claim 1, where said user controlled apparatus comprises personal computer software, provided by the content provider, such that this memory storage component of a personal computer receives, stores and plays back the data files in a sensory perceptible format.

35. The broadcast system of claim 1, where content provider segments and encodes files according to a predetermined subscription service.

36. A corporate broadcast system, where different information is provided to different employees, associates, supplier and distributors, comprising:

- a plurality of newsrooms having means to encode each of the said files with an access code to enable only certain individuals to access the information and means to communicate with buffers;

- a plurality of buffers where the information is compressed, encrypted and multiplexed;

- a transmission means to transmit the encrypted information from the buffers to the user controlled apparatuses; and

- a plurality of user controlled apparatuses, each of which has means to receive and decrypt information intended for that user controlled apparatus.

37. The corporate broadcast system of claim 36, where said user controlled apparatus means to receive and decode information comprises an embedded decryption key.

38. The corporate broadcast system of claim 36, where the said buffers encrypt the information at several levels.

39. The corporate broadcast system of claim 38, where each user controlled apparatuses may have a plurality of embedded decryption keys.

40. A system for transmission, storage and playback of audio works, the system comprising:

- a computer server which stores audio works in digital, time-compressed format and has means to communicate with a wireless transmission means and an audio user controlled apparatus;

- a wireless transmission means to transmit said audio works in time-compressed format from said computer server to an audio user controlled apparatus; and

- an audio user controlled apparatus having means to receive said audio works from said computer server through said wireless transmission means, data storage means for storing said audio works in digital format in individual files and means to convert said stored audio works to a real-time audio output.

41. The system of claim 40, where said data storage means comprises a microprocessor memory.

42. The system of claim 41, where said data storage means further comprises readable/writable memory storage whereby an individual file which has been converted to a real-time audio output is replaced by a new individual file containing a newly received audio work.

43. The system of claim 42, where said data storage means comprises one of the group consisting of a disk drive, a hard drive, a memory card or a flash card.

44. The system of claim 40, where said wireless transmission means comprises satellite transmission means.

45. The system of claim 40, where said wireless transmission means comprises terrestrial RF transmission means.

46. The system of claim 40, where said computer server further comprises means to encode said audio works, said transmission means further comprises means to transmit said encoded audio works, and said audio user controlled apparatus means further comprises means to decode said encoded audio works.

47. The system of claim 40, where said audio user controlled apparatus is portable.

48. The system of claim 40, where said audio user controlled apparatus is mounted in a vehicle.

49. The system of claim 40, where said audio user controlled apparatus comprises means to select a particular individual file for conversion and audio play.

50. The system of claim 40, where said audio user controlled apparatus further comprises access to a modem, hereby specific audio works may be designated for transmission from said computer server to said audio user controlled apparatus.

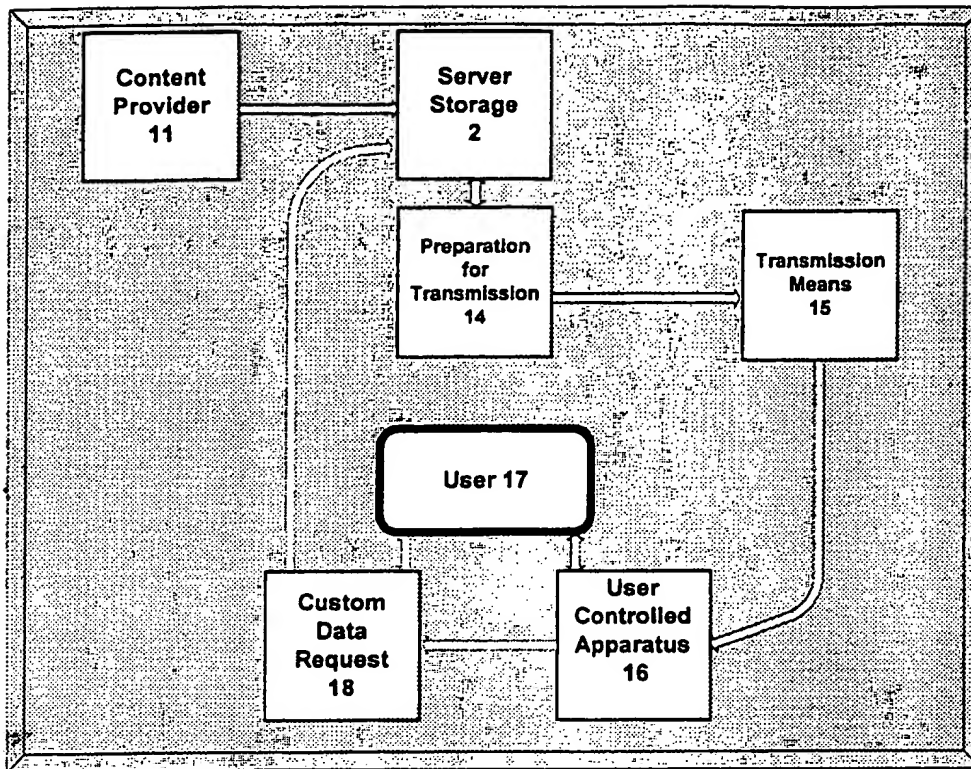


FIG. 1

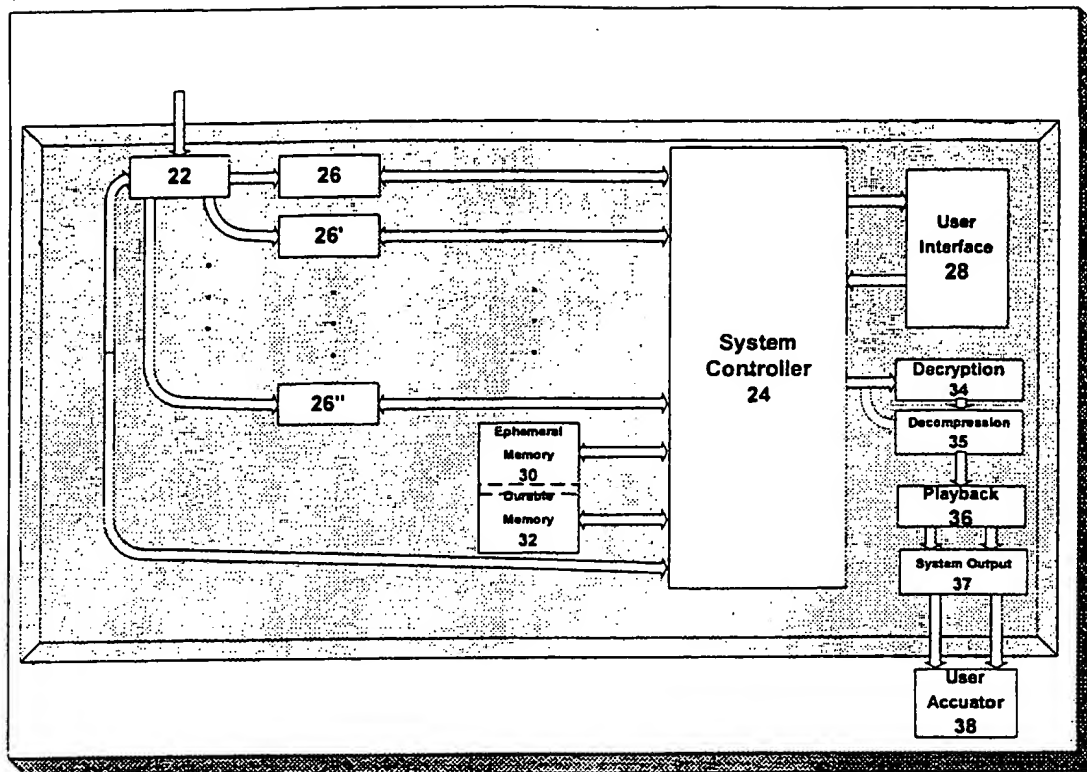


FIG. 2

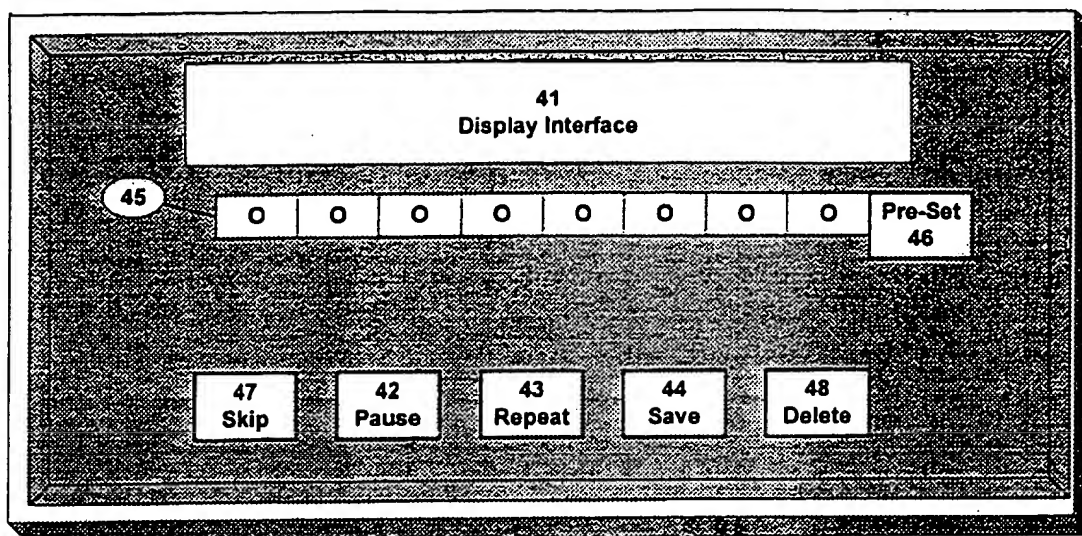


FIG. 3

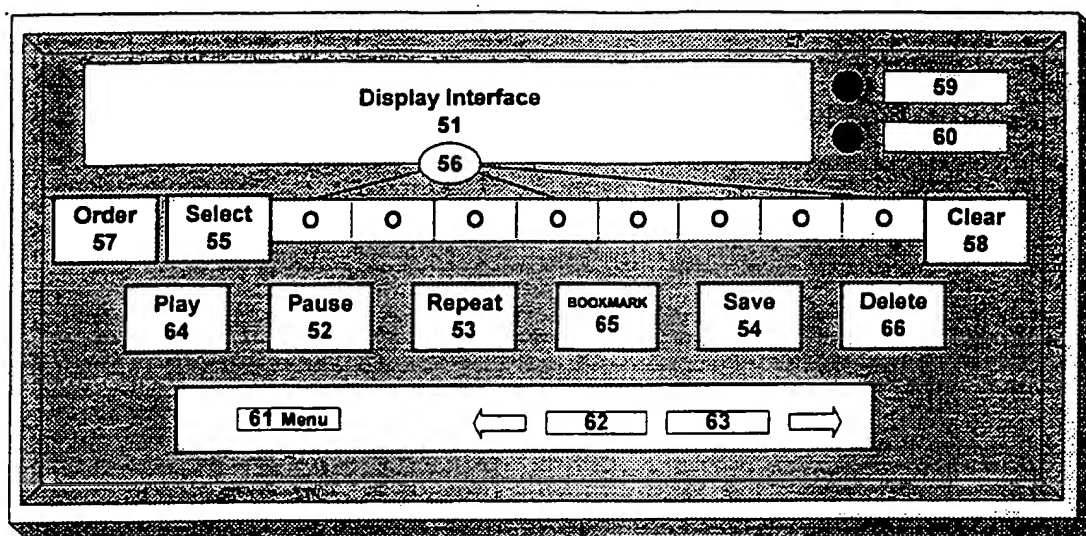


FIG. 4

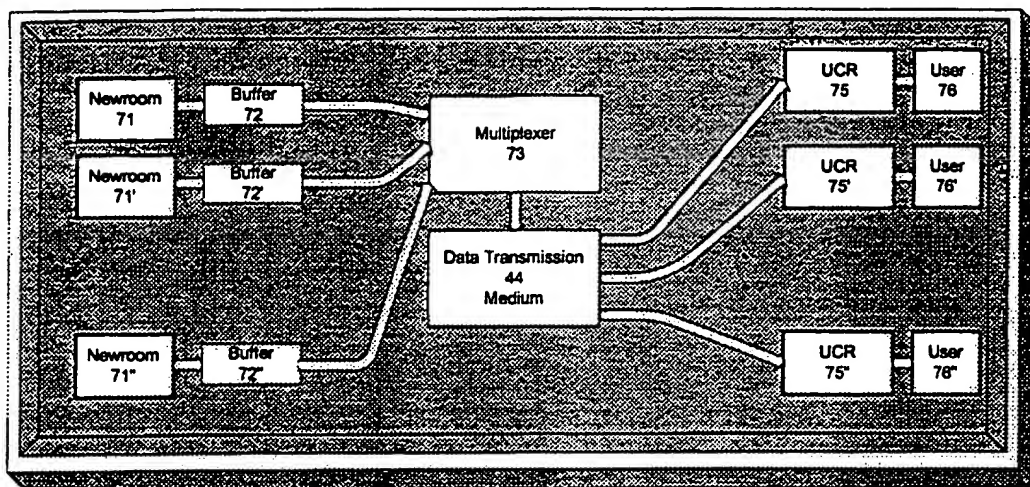


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/29615

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/60

US CL :705/14; 364/479.04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/1, 10, 14; 364/479.04; 348/1, 6, 7, 10, 11, 12, 13

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,848,398 A (MARTIN et al.) 08 December 1998, Whole Document	1-50



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
B earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

14 MARCH 2000

Date of mailing of the international search report

13 APR 2000

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